

[Reprinted from *American Ophthalmological Transactions*, 1900.]

---

THE HISTOLOGY  
OF THE  
LACHRYMAL GLAND IN CHRONIC  
DACRYOCYSTITIS.

BY G. E. DESCHWEINITZ, A.M., M.D.

PHILADELPHIA, PENN.

---

HARTFORD PRESS:  
The Case, Lockwood & Brainard Company  
1900.



# THE HISTOLOGY OF THE LACHRYMAL GLAND IN CHRONIC DACRYOCYSTITIS.

BY G. E. DESCHWEINITZ, A.M., M.D.,

PHILADELPHIA, PENN.

With Bock,\* we may say that the lachrymal gland, independently of neoplastic formation, may be enlarged by an essential inflammation in the form of an acute or chronic dacryoadenitis, by a sympathetic inflammation, that is, in association with inflammatory diseases of the eye, eyelids, or tear-passages, and sometimes by agencies which are not evident. With the microscopic findings in acute and suppurative dacryoadenitis we are not now concerned. The pathological histology of chronic non-suppurative dacryoadenitis is thus summarized by Bock:

“The distinguishing feature in nearly all the findings is the amount of glandular tissue destroyed, and its replacement by accumulations of round cells. The ground-substance for the latter is supplied by the connective tissue in the interior of the gland; this is rich in capillaries and lymph-corpuscles, and in addition to the trabeculæ surrounding the lobules exhibits numerous delicate fibers which ramify among the lobules. The round cells are arranged in rows or ‘streets’ following the course of the connective tissue; some are collected in large closely aggregated groups, others finally in sharply circumscribed circular foci projecting above the level of the surrounding tissue, so that some authors speak of lymphoma of the lachrymal gland. Raymond mentions amyloid degeneration of the newly formed lymphoid tissue.”

Sympathetic inflammation of the tear-gland caused by phlyctenular conjunctivitis, keratitis, corneal abscess, etc., has also been investigated microscopically by Bock, who found the fol-

---

\* Zur Kenntnis der gesunden und kranken Thränendrüse, Wien, 1896.

lowing lesions: "The sections were triangular, and contained part of the conjunctiva from the upper retrotarsal fold. The connective tissue was particularly well developed between the conjunctiva and the gland, and penetrated in robust bundles to some distance among the lobules of the gland. Round cells were scattered throughout the connective tissue, and beneath the epithelium of the conjunctiva there was a continuous layer of closely packed round cells. 'Streets' of round cells could be traced along the fine ramifications of the connective tissue among the lobules. The granulation of the protoplasm of the gland cells was very conspicuous, and the cells were so closely crowded that it was impossible to make out the lumen of a single acinus. The epithelium of the ducts was distinctly swollen; the ducts themselves were surrounded by a dense round-celled infiltration which, around the largest ones, is arranged in the form of small round islands. The bloodvessels were dilated and engorged. The connective tissue underneath the conjunctiva contained colonies of micrococci which occupied the lymph spaces."

The condition of the lachrymal gland in chronic epiphora has been the subject of an interesting research by G. Stanculéanu and A. Théohari.\* These investigators examined sections of the palpebral lachrymal gland from (1) cases of epiphora with intact lachrymal passages; (2) cases of epiphora where the lachrymal passage had been made permeable by the passage of sounds; (3) a case of epiphora with impermeable lachrymal passages; (4) a case of epiphora from congenital dacryocystitis. The lesions found consisted of an interstitial inflammation and certain modifications in the cells of the acini. The latter were in a state of degeneration, the protoplasm being converted into a delicate net-like formation containing brightly staining granulations. In the lachrymal glands of dogs stimulated to excessive action by pilocarpine they also found a punctuated protoplasmic reticulum, *i. e.*, at the intersection of the lines forming the net-like figure there was a fuchsinophile granulation. The similarity of the lesions under these clinical and experimental circumstances has

---

\* Archives d'Ophtalmologie, 18, 1898, p. 737.

led the authors to believe that the hyperactivity of the gland brings about a degeneration of the gland-cells.

In connection with the examinations of Bock, and to a certain extent with those just described, I desire to add an observation of my own.

Mary Craig, aged 48, a widow, was admitted to the Medical Wards of the Philadelphia Hospital for gastritis on August 25, 1897. There is nothing of importance in the patient's family history. She is the mother of four living and healthy children; one child died in infancy of whooping cough. The woman herself was usually in good condition, and gave no account of serious illness, other than the gastritis for which she was admitted to the hospital. Dacryocystitis had existed for some time, and she stated that three operations had been performed without relief. On December 10, 1897, entirely recovered from her gastric attack, she was admitted to the eye-wards with advanced right-sided phlegmonous dacryocystitis, the abscess having ruptured externally; the surrounding facial area was red and brawny. The duct was opened; the sinuses curetted and packed with iodoform. Relief was immediate, and for a time satisfactory. Pus having again begun to form, on May 27, 1898, the lachrymal sac (or its remains) and the duct were removed. Again there was a period of relief, although there never was complete stoppage of supuration, which seemed to come from a pocket which passed upward and inward from the region of the sac. This gave but little trouble, but the epiphora was annoying, and hence on May 10, 1899, the lachrymal gland was extirpated without difficulty, the wound healing promptly. The gland itself was not in the least enlarged, palpation before operation giving only the sensation of a normal gland. Relief from epiphora was complete, but there is still a discharge of pus from the pocket or small sinus previously described, which, I think, leads into the lachrymal division of the ethmoid cells.

The excised gland was immediately placed in a five per cent. solution of formalin, and after hardening sections were cut and stained with hæmatoxylin and eosin. These, which have been

studied by Dr. J. Dutton Steele and myself, presented the following appearances:

The acini are well constituted, the nuclei of the secreting cells being normally placed and properly stained. The protoplasm of these cells, naturally granular, appears, as compared with the protoplasm of similar cells from a normal gland, somewhat swollen, with, perhaps, beginning fatty changes, but this swelling is nowhere sufficient to close the lumina of the acini, as Bock describes in his sections. The interacinous connective tissue is everywhere invaded by quantities of small round cells which are irregularly scattered, or especially gathered in rows or "streets," as Bock calls them, or collected in small roundish masses. They are particularly conspicuous around the ducts, which are usually literally surrounded by them. There are no notable changes in the duct epithelium. These round cells have very large nuclei with scarcely any or no surrounding protoplasm, and possess a darkly staining nuclear membrane on the inner side of which may be seen rather large chromophilic grains, the nucleoli in the center being darkly stained. They have therefore the ordinary composition of lymphoid cells, such as are always found in more or less chronic non-suppurative inflammations. Polynuclear leucocytes are not present.

The bloodvessels of the trabeculæ separating the glandlobules and the interacinous capillaries are not engorged, and their walls are normal. Nowhere has the inflammatory process advanced sufficiently far to destroy the acini; in other words, there is not apparent a destructive process. (Fig. I.)

It is apparent that the findings in this gland closely correspond with the observations of Bock in the portions of the gland which he removed from patients suffering from sympathetic dacryoadenitis, *i. e.*, a dacryoadenitis called into existence by inflammatory conditions of the cornea and conjunctiva. The process, however, appears to be a more chronic one, as there is an absence of engorgement of the vessels and of signs of inflammatory activity. The condition differs from that found in chronic non-suppurative dacryoadenitis (mumps of the lachrymal gland) in the

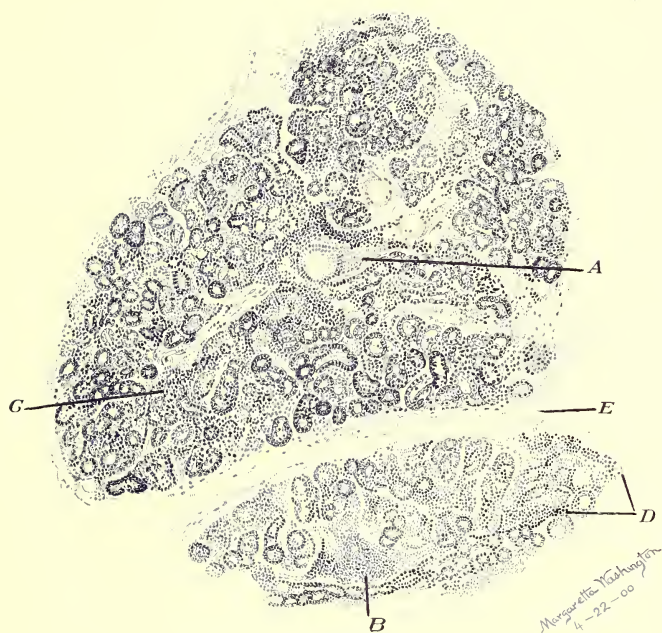


FIG. I. *A*, Round cells (lymphoid cells) surrounding one of the ducts; *B*, Round cells gathered into masses; *C*, General infiltration of interacinous tissues with lymphoid cells; *D*, Cells infiltrating in rows or "streets"; *E*, Interlobular connecting tissue.



Digitized by the Internet Archive  
in 2014

<https://archive.org/details/b21648700>

preservation of the acini, *i. e.*, in the absence of a destructive tendency on the part of the interstitial inflammation.

Stanculéanu and Théohari have also found a more or less chronic interstitial inflammation, but have laid the most stress upon the changes in the protoplasm of the cells, changes which are not evident in my sections. As, however, the technique in each instance was different, no entirely accurate comparison in this respect can be made.

It would seem, therefore, as Bock has well shown, that inflammatory conditions of the cornea, lids, and conjunctiva may infect the lachrymal gland and excite an inflammation in it; naturally, chronic dacryocystitis for similar reason may produce similar results, which may be well developed without causing a noticeable enlargement of the gland, or giving rise to clinical signs indicative of their presence.

Tscherno-Schwartz,\* on the basis of experiments on dogs, believes that diminution or cessation of epiphora after extirpation of the lachrymal sac is due to a compensatory atrophy of the corresponding lachrymal gland. The right tear-gland was excised from my patient just one year after the lachrymal sac had been removed, and certainly there are no signs of atrophy — indeed, the gland was removed to alleviate the annoying epiphora which had always existed, and which was not helped by the ablation of the sac.

---

\* Nagel's Jahresbericht, XXIX, Zweite Hälfte, 1898, p. 633.

